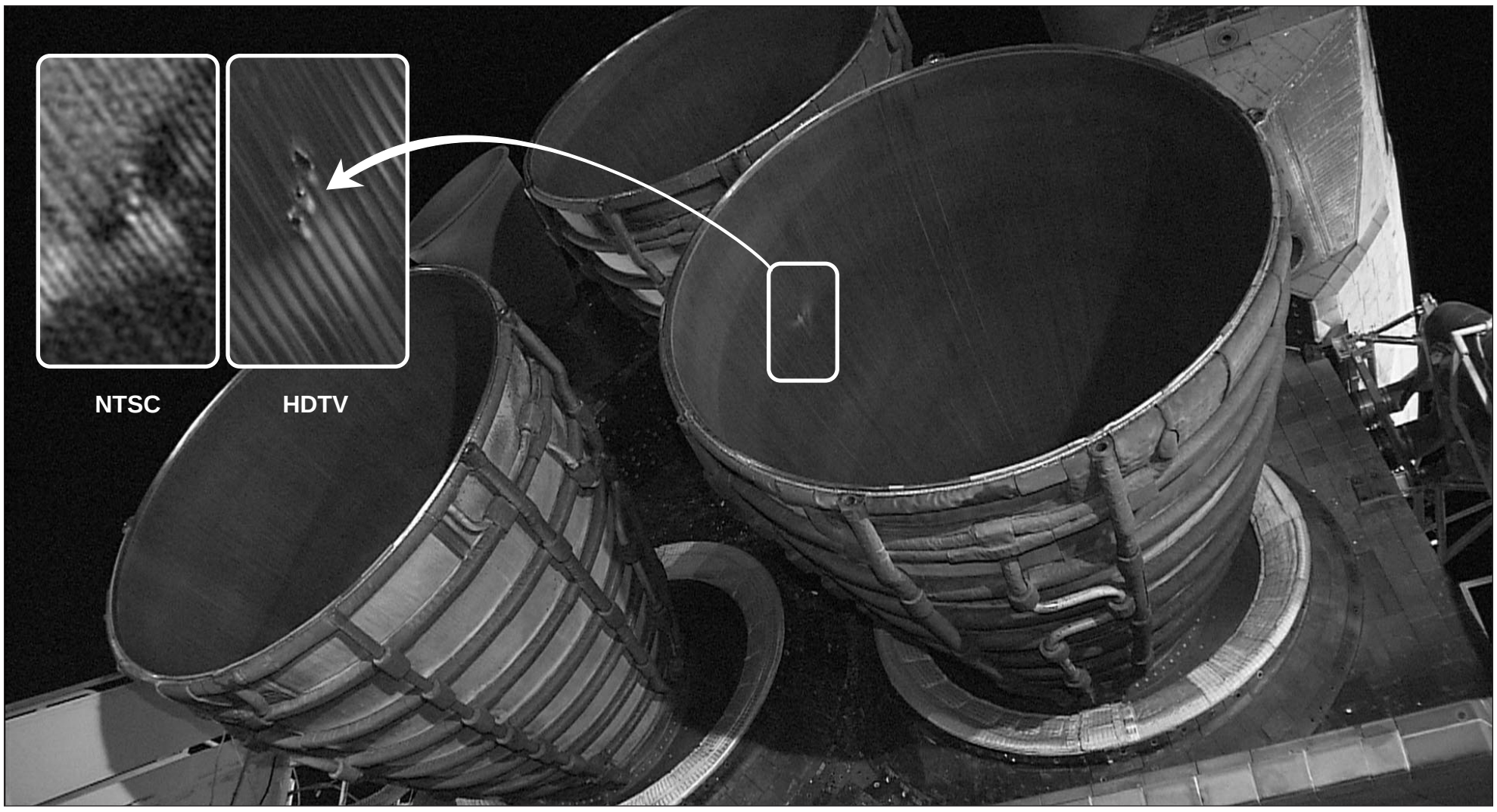


STS-93 image analysts were able to use post-flight HDTV footage to help identify hydrogen leak sites on the main engine bells, shown in inset compared to NTSC image.

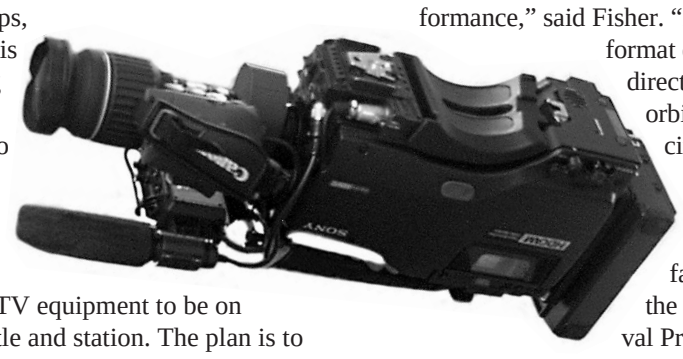
"HDTV color is excellent," said Robinson. "We could tell a difference immediately – it has less of a 'bluish tint' than normal film. We asked the crew and they told us that the HDTV images better reflected how Earth looked from space."

Robinson says the subtle color differences aid scientists in distinguishing natural features, such as forests, reefs and lagoons.

"We're very optimistic," said Robinson. "We'll be able to integrate this information with other satellite imaging technologies, such as Landsat and SeaWiFS (Sea-viewing Wide Field-of-view Sensor). HDTV will really complement our scientific studies."

According to Robinson, one major disadvantage is that NASA does not currently have the necessary editing equipment to extract still images from the HD video. Still images for this DTO were extracted at the NHK (Japan Broadcasting Corporation) editing studios in Japan as part of a collaborative agreement.

All of the benefits achieved so far have been realized by use of the HDTV camcorder alone. The DTV team, made up of Doug Holland, Ken Fisher, Johnnie Reid, Glenn Steele, Vic Studer, Richard Coles, Scott Billups, and others is developing integration hardware to enable commercial-off-the-shelf (COTS) DTV equipment to be on board shuttle and station. The plan is to take an incremental approach, phasing in DTV equivalents of existing analog NTSC components.



The first phase of the implementation called configuration 1, currently scheduled to fly on STS-102, will incorporate a COTS DTV tape recorder (VTR), a DTV camcorder, and a downlink multiplexer.

"We chose DVCAM format for the in-flight recorders because the equipment has advantages such as small size, weight, and power, but has close to professional performance," said Fisher. "Because this format does not directly save the orbiter's closed-circuit TV telemetry, we developed a unique interface box called the Vertical Interval Processor (VIP) that will allow us to store this information using the un-modified VTR. The VIP also provides additional circuitry to allow interfacing of the audio, video and power from the orbiter to the VTR."

Configuration 1 will allow users to capture, record, and downlink high quality standard definition video without ever leaving the digital domain. The DVCAM camcorders are destined to replace the ailing Hi-8mm analog camcorders that have been the standard in-flight camcorders for more than 10 years. The digital downlink multiplexer (MUX) will allow up to four simultaneous video sources to be downlinked through the shuttle Ku-band system using the same channel that is now required to downlink one analog TV signal. The MUX will also provide a common interface for the shuttle and space station communications systems.

The next configuration to be incorporated on STS-105 will include an HDTV camcorder and a compression encoder that allows the world to see for the first time high definition TV live from space. ■

NASA JSC Photo S99-12250 by Benny Benavides

The DTV team, from left, including Richard Coles, Glen Steele, Ken Fisher and Doug Holland, is developing integration hardware to enable commercial-off-the-shelf DTV equipment to be on board shuttle and International Space Station.